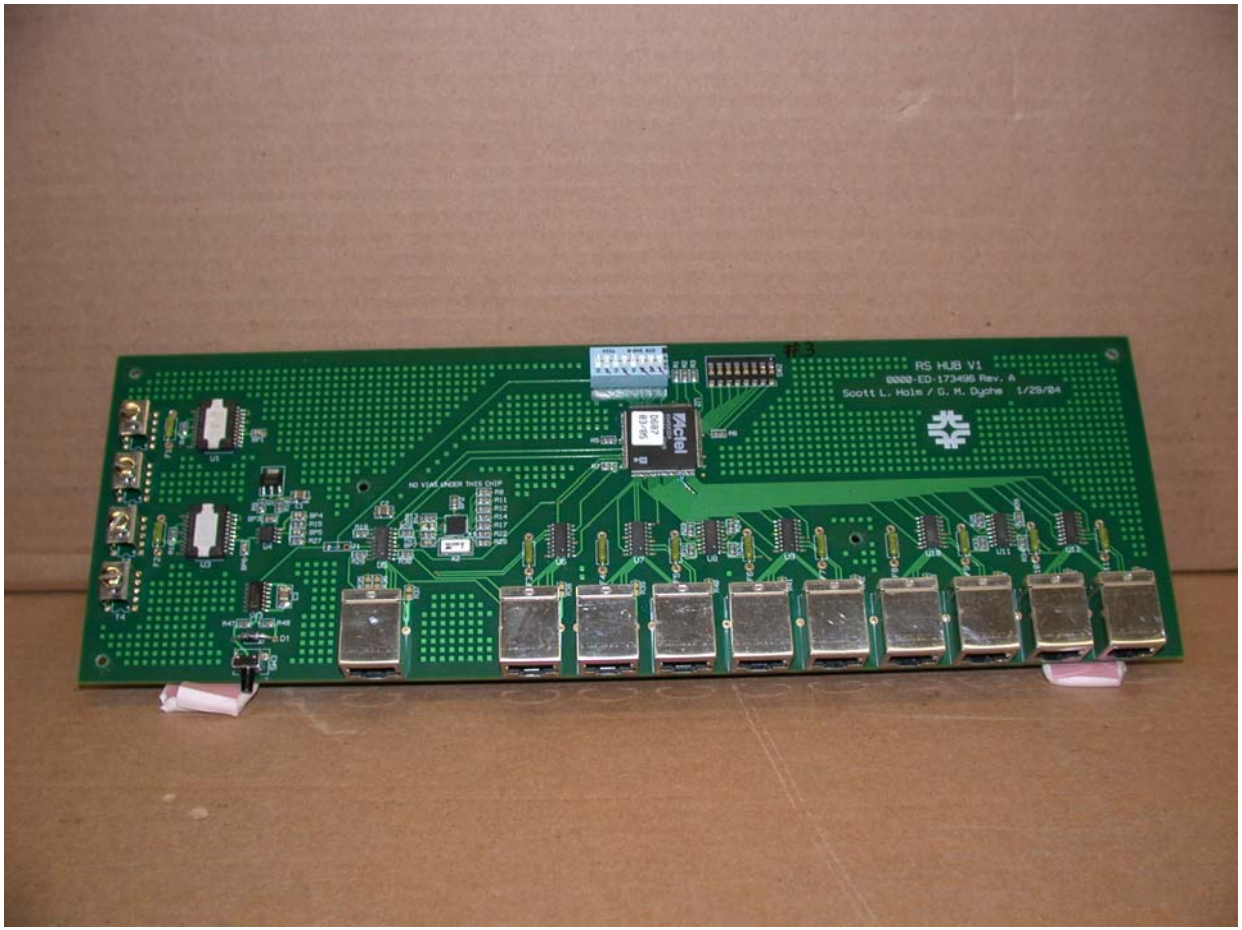
CMS HCAL Custom HUB

Documentation and Communication Protocol



HUB operation

The HUB will receive all Tx commands, if the 8-bit command is a “00” “111111” it will accept the next byte of information to select a port to enable. If the two MSB of the first Tx command is “01”, “10” or “11” or if any of the 6 LSB are a “0” it will start a timer that will wait a predetermined amount of time before it begins checking the incoming Tx commands again. This should keep the HUB from responding to commands that are meant for the CCM. The timer is set to finish after 90us(“01”-command), 170us (“10”- command or any of the 6LSB) and 800us(“11”-command).

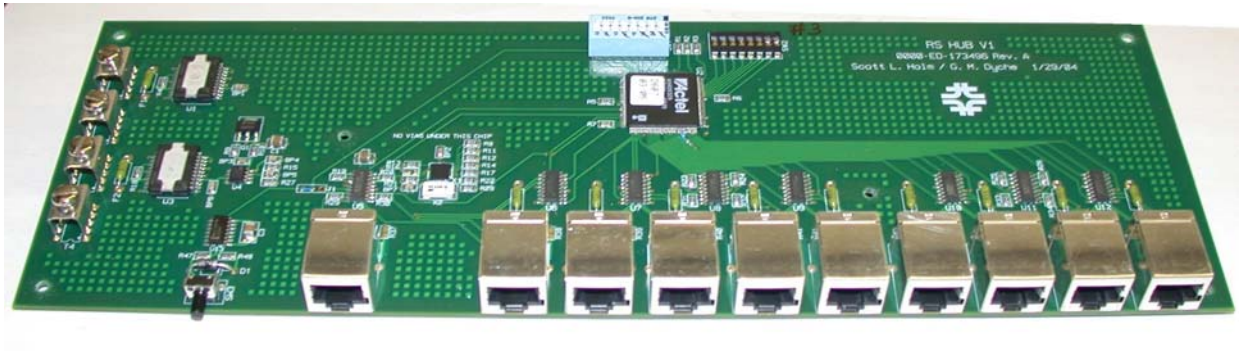
The second byte of information received after the accepted “00” command will enable a port and is capable of generating a reset or break signal for that port. The 4 LSB(3..0) are used to select the port, bit 5 is used for reset and bit 6 for break. If the 4 LSB are all on then all 9 port transmits are enabled for a reset. After receiving the second byte the HUB responds to the system with its 8 bit board address(Node#) followed with an 8-bit status byte. The status byte returned represents: 6 LSB = 6 LSB rescieved, bit 6 overflow, bit 7 parity error. After the Status byte is returned the port will be enabled and the port Rx line is buffered to the HUB Tx line. If a reset was sent it will be sent to the appropriate port. The reset sent to the CCM will be ~800us.

When a ‘break” command is set it will force the Tx line to the CCM to a low state until the next command is sent to the Hub without the “break” command set.

Once a port is selected, the CCM attached to that port has its’ Tx, Rx and reset lines connected to the HUB’s Tx and Rx lines. The HUB will only switch to another port on a “00111111” command followed by a second byte.

After a port is enabled the signal received on the Rx line of the HUB is also received at the CCM Rx line that is connected to the HUB port that is enabled. When the CCM receives a “00” command it will start a timer that doesn’t allow communication with itself for 104us(Time for the HUB to respond to the command).

If a port is not connected to a CCM and it is selected it may cause the next signal sent back from the HUB to be identified incorrectly. The Rx line of the unconnected port is connected to the Tx main line – line that is sending data back to the main control system. The Rx line of the unconnected port may be setting low, causing the Tx main line to be low. When the HUB tries to respond to a command the main system is not seeing a start bit(transistion from high to low). This will in turn corrupt the remainder of the bits being transmitted back to the main system. (Send a reset to fix?)


RS HUB V1
0000-ED-173496 Rev. A
Scott L. Holm / G. M. Dyche 1/29/04
#3
Micrel

CUSTOM HUB
BLOCK DIAGRAM